

## **CHAPTER 3**

### **FLOOD MITIGATION**

#### **3.1 Overview**

Floods have been a problem even before the founding of the United States. Colonial periodicals and ships' logs depict floods in some detail. However, no attempt was made to mitigate floods in the United States until early in the nineteenth century when the Federal Government removed snags and cleared portions of waterways in the Ohio River Basin primarily for navigation. Just before the turn of the century, the Federal Government began to work with local communities to develop levees and revetments. Structural measures to reduce flood damages began in earnest after 1917 and continued until its peak in the 1960-1980 "golden age of dam construction."

In the mid-1950s, a group of consultants, interested citizens, and Federal and local government representatives met to discuss alternate methods of reducing flood damages in the United States. As a result of this meeting, they introduced the concept of nonstructural alternatives. The Tennessee Valley Authority (TVA) initiated a regional floodplain management assistance program in 1953 providing technical assistance to communities as the basis to encourage floodplain regulations. However, growth was slow until the mid-1960s when the Federal floodplain management services groups were implemented in the United States. In addition to floodplain management and Federal regulation of the Nation's floodplains, disaster preparedness and floodproofing came into vogue as nonstructural solutions. One particularly effective nonstructural means to minimize loss of life and property from floods (principally flash floods) is a flood warning system.

#### **3.2 LFWS Development**

The NWS has been a leader in developing technology for LFWSs. Early systems (some still operating) could monitor a single event and had only one sensor. These flash flood alarm systems prompted the development of continuous monitoring systems using the expanding technology of small computers. NWS uses two LFWS technologies: (1) the network-configured system, developed within various NWS components as IFLOWS, and (2) ALERT, developed at the NWS California-Nevada RFC. These NWS-developed systems include specific software loads that operate in a limited number of hardware environments.

IFLOWS is a federally funded NWS program that has cooperative arrangements with seven states in the Appalachia region. It is possible (and encouraged) for other communities and states to fund their own hardware (that meets LFWS standards in this Handbook) and use IFLOWS technology. ALERT systems are community funded or occasionally funded by other Federal or state agencies. Although the data collection capabilities of the two systems are identical, information output is different. ALERT generally provides a one-way alarm of a pending flood event, while IFLOWS provides continuous two-way communication of data and products among the NWS, state, and county offices so that appropriate actions may be

coordinated. IFLOWS and/or NWS ALERT base stations have been installed in many NWS offices.

In the modernized NWS, AWIPS will integrate all sources of data and interface to all dissemination systems, including all automated LFWSs. High-resolution digital radar-based precipitation estimates will provide a means for calculating flood/flash flood potential and forecasting floods across most of the Nation—not just those areas covered by LFWS. Integration of technology and data sources encourages information exchange with LFWSs.